Coordinating R&D activities in multinational companies: towards new tools and practices?

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Introduction

Over the past few decades, scholars have shown a growing interest in the topic of innovation processes in multinational enterprises (MNE) (Cantwell, 2009). Management systems of MNEs are complex (Hennart, 2009; Mayrhofer, 2011), mainly because of the geographical dispersion of their activities (Buckley and Ghauri, 2004; Dunning, 2009). Recent statistics provided by UNCTAD (2010) report a significant increase of R&D investments in emerging markets, which offer interesting growth perspectives. In fact, territorial attractiveness is undergoing important changes, and MNEs need to optimise their location choices, especially for R&D activities (Colovic and Mayrhofer, 2011).

The internationalisation of the value-chain raises critical questions linked to the coordination of innovation processes. In the past, MNEs created R&D units abroad to adapt their products to the needs of host countries (Nobel and Birkinshaw, 1998). Today, these units increasingly contribute to the process of innovation, some of them becoming centres of excellence (Reger, 2004). This trend has important implications for the management of innovation processes developed by MNEs. Companies thus need to develop frequent interactions between headquarters and subsidiaries. Existing research shows that it is difficult to structure these relationships (Doz and Prahalad, 1991; Bartlett and Ghoshal, 1992; Birkinshaw and Pederson, 2009): "*MNE parent company and one of its subsidiaries cannot just decide upon a simple, optimal structural context that would determine all their interactions*" (Rugman and Verbeke, 2001, p. 246).

Given the important challenges concerning the management of innovation, the objective of this paper is twofold: (1) to contribute to a better understanding of coordination mechanisms of innovation processes in multinational enterprises, and (2) to propose new tools and practices that can be used by MNEs to efficiently manage their innovation processes. In the first part, the authors report recent trends concerning the internationalization of R&D activities and analyze the innovation process adopted by the French SEB group which is currently changing its R&D policy. In the second part, they examine different coordination mechanisms that can be used by MNEs to coordinate their R&D activities, with a specific focus on "communities of practice".

1. Challenges faced by MNEs in the field of R&D

In a rapidly changing environment, companies need to constantly adapt their innovation processes. Following the internationalization of R&D activities, multinational enterprises (MNEs) face new challenges concerning the organization of their innovation practices.

1.1. The growing internationalization of R&D activities

Available statistics report a significant increase of research & development (R&D) investments (UNCTAD, 2010) in foreign countries, especially in emerging markets. R&D investment remains a strategic priority for MNEs, despite the difficult economic environment. The growing internationalization of R&D activities creates managerial challenges for globally competing MNEs (Manolopoulos *et al.*, 2011). Innovation is an important tool to create value. The concept has been widely studied as evidenced by the JIBS (Journal of International Business Studies) 40/AIB (Academy of International Business) 50 anniversary issue on innovation in international business theory (Eden, 2009) and innovation processes in multinational enterprises (Cantwell, 2009). One of the most critical research questions about innovation in MNEs is how to manage the relationships between R&D operations around the world (Nobel and Birkinshaw, 1998). Important problems of coordination may arise, particularly when R&D units are located in geographically dispersed countries (Hedlund and Ridderstråle, 1995).

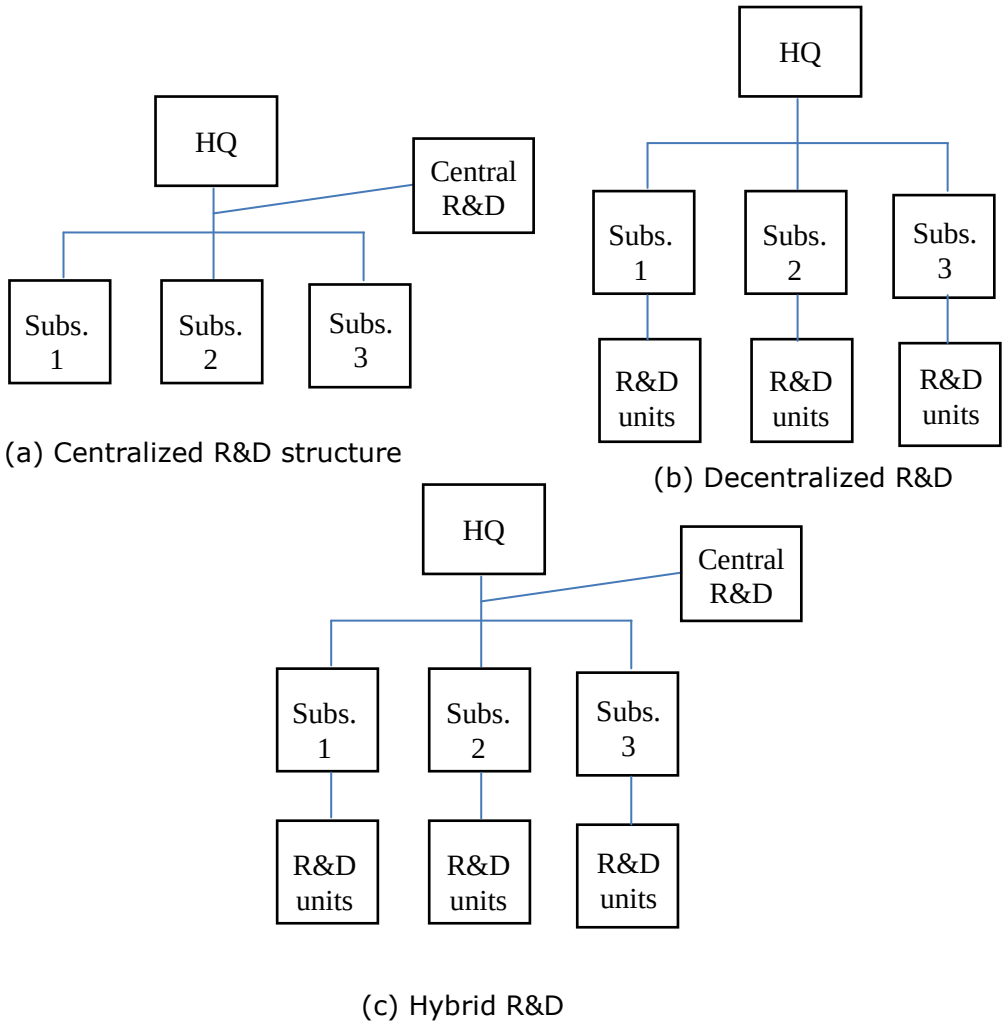
Today, MNEs need to identify consumer trends in emerging countries, link them to new technologies and develop new products and services, and finally disseminate these innovations rapidly worldwide (Bartlett *et al.*, 2004). Innovation processes are moving increasingly towards emerging markets such as China and India, as these countries develop their technological capabilities. According to a study conducted by the French government in 2008, "France 2025", the United States, Europe and Japan will be among the world's major players in R&D, even if their relative importance in terms of R&D investment is likely to decrease. In fact, emerging markets in Asia will attract significant investments, and China and India could represent about 20% of R&D investments in the world. The internationalization of the value-chain raises critical questions linked to the coordination of innovation processes. *"Today's game of global strategy seems increasingly to be a game of coordination-getting dispersed production facilities, R&D laboratories, and marketing activities to truly work*

together. Widespread coordination remains the exception rather than the rule today in many multinationals" (Bartlett *et al.,* 2004: 337). Coordinating activities associating different teams and individuals has become a fundamental organizational problem (Grant, 1996). Thus, MNEs still have to face the famous dilemma “global vs. local”, or “global integration vs. local responsiveness” (Doz and Prahalad, 1984). Since companies need to access knowledge developed in different countries to remain competitive, more research focuses on the issue of knowledge management within MNEs (Adenfelt and Lagerstrom, 2008; Bouquet *et al.,* 2009) and the importance of coordinating learning (Reger, 1999). *"Enterprises are encouraged to conduct R&D near the poles of scientific excellence and to build a global network of knowledge"* (Mayrhofer and Urban, 2011: 197).

Traditionally, innovation strategies of MNE are dominated by two processes: "center-for-global" and "local-for-local". These strategies illustrate the conflict that may arise between the willingness of headquarters to centralize R&D and innovation processes (global integration of activities) and the need to recognize the variety of local environments to which the MNE has to adapt (local response activities). In the first case, innovation is designed at the headquarters of the MNE to be developed in the home market before being used worldwide. The role of subsidiaries then is to introduce the innovation in their local market. In the second case, the focus is on the specificities of each national market in which subsidiaries are located and the need to adapt to their particular context. Thus, subsidiaries achieve innovation with their own resources and skills to meet the demand in their market.

In terms of R&D activities, the literature differentiates three organizational structures: (1) the centralized R&D structure, (2) the decentralized R&D structure, and (3) the hybrid R&D structure (Argyris and Silverman, 2004, see figure 1). The type of structure adopted by a company will affect the outcomes in terms of internal networks, communication, technological research processes, etc. The question about the local or global scope of R&D activities appears to be dialectic. For example, one can observe that centralized R&D does not favour the integration of the demand of the local market (Argyris and Silverman, 2004).

Figure 1: Typology of R&D organizational structures (adapted from Argyris and Silverman, 2004: 932-933)



The choice of the organizational structure largely determines the roles taken by different R&D units. Several typologies of foreign R&D units have been proposed. Nobel and Birkinshaw (1998) distinguish three types of R&D subsidiaries: (1) local adaptors, (2) international adaptors, and (3) international creators. The typology is similar to the one developed by Pearce (1989) and Manolopoulos *et al.* (2011) (see table 1). Each type of R&D unit is managed through a different mode of control and communication system (Nobel and Birkinshaw, 1998) and uses specific coordination mechanisms (Manolopoulos *et al.*, 2011). Both studies indicate that vertically imposed formal coordination mechanisms represent an efficient organizational mode for achieving the benefits of global scale and learning. Recent years have witnessed the development of 'Centers of Excellence'. In this case, the headquarters select a subsidiary which possesses distinct knowledge (Adenfelt and Lagerström, 2008) to be responsible for the global knowledge processes within the MNE.

Table 1: Typologies of R&D units roles

Nobel and Birkinshaw (1998)	**Local adaptor**	**International adaptor**	**International creator**
Role	Facilitate the transfer of technology from the parent company to the subsidiary manufacturing location	Develop products for the local market; the role is broader in scope and the unit more creative than the local adaptor	Provide input for a centrally defined and coordinated R&D program
Manolopoulos *et al.* (2011)	**Support laboratory**	**Locally integrated laboratory**	**Internationally independent laboratory**
Role	Tactical support for the localized application of the established technology of the MNE	Provide backup for a local production unit by developing new products for the local market	Carry out basic or applied research as a part of a precompetitive R&D program

1.2. The innovation process of the SEB group

The SEB group, a French multinational company based in Lyon, is a world leader in small household equipment and produces small domestic appliances and cookware. The global market for small electrical appliances is estimated at 26.5 billion euro per year, of which SEB possesses a market-share of around 10%. The sales of the cookware market represent 6.5 billion euro per year, of which the group holds almost 16%. The company employs 23.000 people and is present in 150 countries worldwide with 24 production units and 60 commercial units.

The history of the SEB group is marked by several major innovations (e.g. Super Cocotte, Actifry deep fryer, non-stick coating and self-cleaning iron soleplate). As emphasized by Thierry de La Tour d'Artaise, Chairman and CEO of the SEB group, *"our economic model is based on growth that we search through innovation, the continuation of our international expansion, the power of our brands and a diversified distribution"* (SEB group, 2010, p. 1). For the group, innovation represents a strategic asset that allows to maintain and to reinforce its position in the global market.

In 2010, the SEB group was awarded twice for its initiatives in the field of innovation: (1) the special prize of "Best Innovator", given by AT Kearney and the French economic newspaper "Les Echos", to distinguish the pro-activity of the group concerning innovation; (2) the

"Hermes of the innovation", handed during the third French meeting of directors of innovation, to reward the ability of the company to combine technological progress, high performance and customer satisfaction.

Over the past few years, the SEB group has drawn specific attention to the quality of resources employed for innovation. Recently, R&D teams were reinforced by the recruitment of specialists with different backgrounds, such as chemistry, nanotechnologies and agri-foods. The objective is to trigger the innovation process by designing new products and developing synergies between complementary technologies. R&D projects are led in a "network organization" that employs in-house resources and external partners such as suppliers, research institutes, universities, industry-leading companies, laboratories. The adopted approach seems particularly relevant in the current business environment marked by fierce competition and shorter product lifecycles. Manufacturers need to be proactive and to reduce the time-to-market for new products. The differentiation and the enhancement of the product range (e.g. unique concepts, new options, unusual designs) allow the company to sell at relatively high prices and to improve its margins. As mentioned by the director of internal audit, *"we do not know how to make cheap products. We are really in a business model where we pull our sales by the innovation and this is true not only for high-range but also mid-range products".* This innovation policy led to a constant increase of R&D costs: between 2006 and 2010, R&D expenses made by the group shifted from 46 million euro to 73 million euro.

The innovation process of the SEB group includes three phases: (1) exploration, (2) demonstration and (3) realization (see table 2).

Table 2: The innovation process of the SEB group

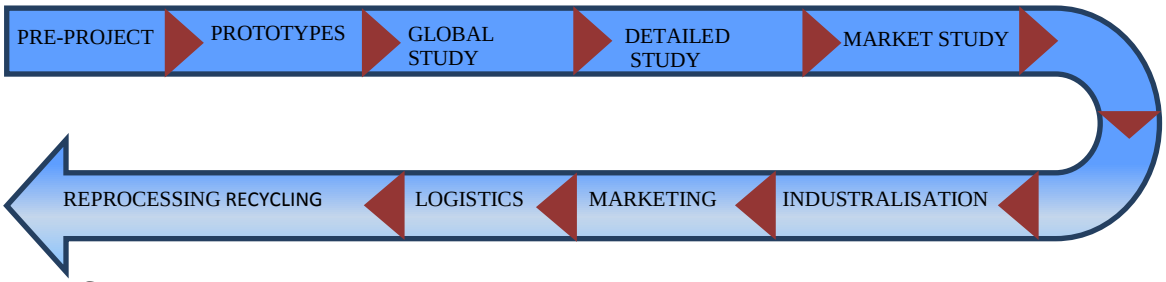
Exploration		**Demonstration**		**Realization**	
Strategic ambitions	Scientific knowledge	Scenario of usage	Proposals of the product architecture	Design of the product	Manufacturing of the profile products
Future trends and their validation	Technical tracks	Validation of targets	Selection of the preferred solution	Construction of the retail kit	Selection and tuning of the equipment
Marketing concept and its validation	Validation of technical track	Valuation and positioning	Demonstration on a prototype	Commercial launch	Implementation of the processes of fabrication

Source: SEB

The innovation policy implemented by the SEB group is based on a multi-disciplinary approach, associating teams from different business functions (R&D, manufacturing, purchasing, logistics, strategic marketing, design, quality, etc.). The company is organized by business units: « cookware », « electrical appliances » and « personal care, home care ». Each unit is composed of three teams working for the implementation of innovation: marketing, technical support and design (Arzumanyan and Melin, 2011). In order to manage communication flows and avoid conflicts, a committee of product innovation was set up within each business unit. The key advantage of this organization for the innovation process is the "pooling" of resources and the sharing of best practices. To reinforce this advantage, a two-day "Innovation Forum" is organized for R&D teams each year. This event brings together 270-300 people from around the world to discuss the group's research priorities, to share the knowledge and know-how of the development process, and to get updates on the progress of major projects and programs managed centrally.

The sharing of information across the organization is facilitated via multiple project platforms, information technology based tools and expertise (intranet, databases and other cross-functional resources). Besides, these tools enable the group to monitor the progress on each project. This is the case in particular for the "Product Lifecycle Management System", which consolidates and updates on a regular basis all the information related to the given project accessible to all the participants (see figure 2).

Figure 2: The product lifecycle management of the SEB group



Source: SEB

The group has also set up a community of innovation with the objective to improve the efficiency of the innovation process and to reduce the time necessary for the launch of new products. This structure allows important synergies between different teams, but also with external partners. As mentioned by the director of innovation of SEB, *"our dynamics of innovation results from an intense flow of exchange between the marketing, R&D and design teams. It is also stimulated by the interaction with external skills. For example, the SEB group recently established a partnership with management, engineering and design schools to deepen the analysis and the consideration of disability in the culinary approach"* (SEB group, 2010, p. 35).

2. Coordinating R&D activities in MNEs

The coordination of geographically dispersed R&D activities has become an important challenge for MNEs. They need to carefully select coordination mechanisms in order to efficiently manage their innovation processes.

2.1 Coordination mechanisms in MNEs

Coordination mechanisms set up to coordinate activities, departments, functions are central for the innovation process. Mintzberg (1989) argues that coordination mechanisms are "the glue" that holds the stones of an organization's building. This is particularly true today, because of the globalization of markets, the geographical dispersion of the value-chain (Buckley and Ghauri, 2004) and the importance of emerging markets such as BRIC countries.

(Brazil, Russia, India, China). Boundaries of organizations have become more difficult to determine in their scope. For MNEs, it has become crucial to match the configuration and coordination of their activities (Bartlett *et al.*, 2004) in order to remain competitive. Today, innovation is subject to strong constraints in regard to time, including competition in the market of imitation, quality and costs. In this context, coordination between subsidiaries, research laboratories and headquarters of MNEs is essential.

Based on an analysis of 85 research articles, the study conducted by Martinez and Jarillo (1989, 1991) allows to differentiate two categories of coordination mechanisms in MNEs: formal and subtle (informal) mechanisms (see table 3). These mechanisms are administrative instruments for the integration of various units within the organization. According to the authors, the coordination mechanisms are not independent from each other and an organization needs to combine both formal and informal mechanisms.

Table 3: The coordination mechanisms (adapted from Martinez and Jarillo, 1991)

Formal mechanisms	**Variables**
Centralization	Degree of autonomy in decision making
Formalization	Level of formalization and standardization
Planning	Extent of planning
Output control and behavioral control	Financial performance, technical reports, direct supervision, etc.
Subtle (informal) mechanisms	**Variables**
Lateral relations	Level of participation in committees, teams, task forces, etc.
Informal communication	Extent of informal communication
Organizational culture	Degree of socialization, organizational culture

Concerning the coordination of R&D activities, MNEs can also use other types of coordination mechanisms. Nobel and Birkinshaw (1998) analyze control modes and communication systems that characterize the mechanisms for coordinating R&D units. Control modes can take the form of centralization and formalization (as formal mechanisms according to Martinez and Jarillo, 1991) as well as socialization (as informal mechanisms according to Martinez and Jarillo, 1991). The communication system is defined as *"the*

exchange of information through media including various face-to-face visits, letters, phone calls, and electronic mail" (Nobel and Birkinshaw, 1998: 484).

Available empirical studies agree that the coordination of R&D activities in MNEs requires various, simultaneous coordination mechanisms with different levels of intensity (Martinez and Jarillo, 1991; Nobel and Birkinshaw, 1998; Harzing, 1999; Reger, 1999, 2004, Argyris and Silverman, 2004; Manolopoulos *et al.*, 2011). As shown by table 4, coordination mechanisms are likely to vary according to the type of R&D unit.

Table 4: Coordination mechanisms used for different types of R&D units

− Low level −/+ Moderate level + High level		**Mechanisms of coordination**			
		Centralization	Formalization	Socialization	Communication systems
Types of R&D units (Nobel and Birkinshaw, 1998)	**Local Adaptors**	−	+	−/+	Embedded in local context
	International adaptors	+	−/+	−	More communication with other corporate entities
	International creators	−/+	−	+	More communication with external entities (foreign universities, customers and suppliers)

Based on Nobel and Birkinshaw (1998) and Manolopoulos *et al.* (2011)

The strategic mission of a decentralized R&D unit determines the choice of coordination modes. Reger (1999, 2004) differentiates two levels of coordination mechanisms: (1) the normative/strategic level ("which reflects the contexts of the company's environment", 1999: 28) and (2) the operational level ("which reflects the work-and task-related contexts", 1999: 28). The author also highlights new modes of coordination such as hybrid/overlaying mechanisms and internal markets. Hybrid mechanisms are a combination of structural and informal mechanisms used for the implementation of R&D projects, interdisciplinary projects or strategic projects. Internal markets correspond to potential negotiations between supply and demand groups within the organization, who coordinate their services via internal discounts or internally fixed prices. Reger (2004) mentions several key factors that are likely to influence coordination mechanisms of MNEs: the organizational element of process or structure (process *vs.* structural orientation), the locus of decision marketing (centralized *vs.*

decentralized), the location of competencies (home-based *vs.* foreign-based competencies) and cultural differences between nations or regions (low *vs.* high cultural differences).

According to Reger (2004), several MNEs have restructured global R&D towards corporate-wide centers of excellence (CoE). A research CoE is defined as *"a set of superior competencies in research and technology possessed by a particular organizational unit, the use of these competencies by other parts of the firm, and the explicit recognition of this unit as an important source of technological knowledge creation"* (Reger, 2004: 55). The author emphasizes the necessity to coordinate different CoEs.

2.2. Communities of practice

"Communities of practice are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger *et al.*, 2002: 4). They allow to improve the coordination of decentralized sub-units or groups within large organizations (Lindkvist, 2005) and to manage knowledge as an asset (Wenger *et al.*, 2002: 6). Whenever a company's headquarters and its subsidiaries need to interact on a regular basis, e.g. when some decisions are made by local subsidiaries, while others are made on the group level, it is essential that different entities communicate and cooperate in an efficient way.

The 'communities of practice' approach has become increasingly influential in both the management literature and business practice (Roberts, 2006). The number of companies using communities of practice (CoP) is constantly growing, and many of them discover that communities of practice are the "ideal" social structure for "stewarding" knowledge (Wenger *et al.*, 2002). Table 5 indicates the most frequently used management and coordination structures for innovation processes.

Table 5: Knowledge coordination structures, their characteristics and limits

Structure type	Characteristics	Limits
Business units	Focus on immediate opportunities in the market in order to achieve their business goals	Learning usually takes the back seat
Project teams	Temporary	Their knowledge is largely lost when they disband
Ongoing operational teams	Focused on their own tasks	Their knowledge often remains local
Traditional knowledge oriented structures (corporate universities and centers of excellence)	Usually located at headquarters	Separated from the line employees who would put the knowledge to use

Adapted from Wenger *et al.* (2002)

In contrast to the structures mentioned in table 5, communities of practice remain as long as there is an interest to maintain the group, thus allowing an exchange of knowledge between the self-selected members and leading to the development of the participants' capabilities. CoPs also allow to keep up with the changes in the organization triggered by market shifts (Wenger *et al.*, 2002) and to link learning with practice (McDermott, 1999; Thomas *et al.*, 2001). *"Communities of practice can drive strategy, generate new lines of business, solve problems, promote the spread of best practices, develop people's professional skills, and help companies recruit and retain talent"* (Wenger and Snyder, 1998: 140).

They create value in multiple and complex ways, both for their members and for the organization. Wenger *et al.* (2002) emphasize the following values:

(1) Short-term and long-term value: Members of CoPs help each other solve immediate problems, but also accumulate their experience in a knowledge base. Along with addressing current problems, communities of practice are also building sustained value by developing an ongoing practice. They can coordinate efforts and find synergies across organizational boundaries.

(2) Tangible and intangible value: The value communities create tangible results such as a standards manual, improved skills, or reduced costs through faster access to information. The value can also take the form of less tangible outcomes such as a sense of trust or an increased ability to innovate.

(3) Strategy-implementing and strategy-making value: Communities of practice provide value through their abilities to develop new strategies as well as implement existing ones. They

represent a way to realize a business strategy, but they can also contribute to the formulation of new strategies.

When highly developed, influential communities of practice can inform or enact new strategic initiatives as illustrated by table 6.

Table 6: Value generated by communities of practice

	Short-term value	**Long-term value**
	Improve business outcomes	**Develop organizational capabilities**
Benefits to organizations	Arena for problem solving Quick answers to questions Reduced time and costs Improved quality of decisions More perspectives on problems Coordination, standardization, and synergies across units Resources for implementing strategies Strengthened quality assurance Ability to take risks with backing to the community	Ability to execute a strategic plan Increased retention of talent Capacity for knowledge-development projects Forum for "benchmarking" against rest of industry Knowledge-based alliances Emergence of unplanned capabilities Capacity to develop new strategic options Ability to take advantage of emerging market opportunities
	Improve experience of work	**Foster professional development**
Benefits to community members	Help with challenges Access to expertise Better able to contribute to team Confidence in one's approach to problems Fun of being with colleagues More meaningful participation Sense of belonging	Forum for expanding skills and expertise Network for keeping abreast of a field Enhanced professional reputation Increased marketability and employability Strong sense of professional identity

Source: Wenger *et al.* (2002: 16)

Lee and Cole (2003) have elaborated a "community-based model" which clearly differentiates from the firm based model (see table 7).

Table 7: The community-based model vs. the firm-based model of knowledge creation

Organizing principles	Firm-based model	Community-based model
Intellectual property ownership	Knowledge is private and owned by the firm.	Knowledge is public but can be owned by members who contribute it as long as they share it.
Membership restriction	Membership is based on selection, so the size of the firm is constrained by the number of employees hired.	Membership is open, so the scale of the community is not constrained.
Authority and incentives	Members of the firm are employees who receive salaries in exchange for their work.	Members of the community are volunteers who do not receive salaries in exchange for their work.
Knowledge distribution Across organizational and geographical boundaries	Distribution is limited by the boundary of the firm.	Distribution extends beyond the boundary of the firm.
Dominant mode of communication	Face-to face interaction is the dominant mode of communication.	Technology-mediated interaction is the dominant mode of communication.

Source: Lee, G. and Cole, R. (2003: 635)

Despite their benefits, communities of practice are not as widespread as could be expected. Wegner (2000) acknowledges that creating and preserving CoPs and making them part of an organization represents an important challenge. However, several forward-thinking companies have already initiated well thought-out processes to encourage the development of CoPs. There is an interest in reaping the benefits that CoPs have to offer, but more in-depth studies are needed to explain organizations what to expect and how to interact with CoPs. In order to become an accepted practice, the gap between conceptual and practical aspects of CoPs has to be bridged *via* in-depth emprical studies (Dameron and Josserand, 2007). Such studies should involve a clearly-presented mechanism of interaction between an organization's headquarters and its subsidiaries. This mechanism should be easily adaptable to the context of the organization adopting this new method of knowledge coordination and management. CoPs have a strong potential to contribute to value-creation in MNEs by complementing and enhancing existing coordination mechanisms of innovation processes.

Conclusion

The analysis presented in this paper shows that MNEs need to extend and coordinate innovation processes on a global scale in order to remain competitive. "*Successful*

international competitors in the future will be those who can seek out competitive advantages from global configuration/coordination anywhere in the value chain, and overcome the organizational barriers to exploiting them" (Bartlett *et al.*, 2004, p. 337). The choice of appropriate coordination mechanisms allows to improve the management of innovation processes, but their application depends on the organization structure adopted by the company.

As emphasized by Wenger *et al.* (2002), MNEs need to understand what knowledge can provide a competitive advantage and exploit knowledge in different locations with the aim to transfer it to other subsidiaries. Appropriate tools and practices can help companies to efficiently coordinate R&D activities. Given the increasing geographic dispersion of their value-chain, large companies need to find new ways to coordinate R&D activities. This contribution shows that communities of practice represent an interesting approach to improve innovation processes that associate teams from different parts in the world.

Bibliography

Adenfelt, M. and Lagerstrom, K. (2008), The development and sharing of knowledge by centres of excellence and transnational teams - a conceptual framework, *Management International Review*, Vol. 48, N° 3, pp. 319-338.

Argyris, N.S. and Silverman, B.S. (2004), R&D, organization structure, and the development of corporate technological knowledge, *Strategic Management Journal*, Vol. 25, N° 8/9, pp. 929-958.

Arzumanyan, L. and Melin, Ch. (2011), Le processus d'innovation au sein des firmes multinationales : le cas du groupe SEB, in U. Mayrhofer (ed.*), Le management des firmes multinationales*, Paris, Vuibert, pp. 141-152.

Bartlett, C.A. and Ghoshal, S. (1992), What is a global manager?, *Harvard Business Review*, Vol. 70, N° 5, pp. 124-132.

Bartlett, C.A., Ghoshal, S. and Birkinshaw, J. (2004), *Transnational Management: Text, Cases, and Readings in Cross-Border Management*, 4th edition, Boston, McGraw Hill.

Birkinshaw, J.M. and Pederson, T. (2009), Strategy and management in MNE subsidiaries, in A.M. Rugman and T. Brewer (eds.), *Oxford Handbook of International Business*, 2nd ed., Oxford, Oxford University Press, pp. 367-388.

Bouquet, C.; Morrison, A. and Birkinshaw, Julian M. (2009), International attention and multinational enterprise performance, *Journal of International Business Studies*, Vol. 40, N° 1, pp. 108-131.

Brown, J.S. and Duguid, P. (1991), Organizational learning and communities of practice: Toward a unified view of working, learning, and innovation, *Organization Science*, Vol. 2, N° 1, pp. 40-57.

Buckley, P. J. and Ghauri, P. (2004), Globalisation, economic geography and the strategy of multinational enterprises, *Journal of International Business Studies*, Vol. 35, N° 2, pp. 81-98.

Cantwell, J. (2009), Innovation and information technology in the MNE, in A.M. Rugman and T. Brewer (eds.), *Oxford Handbook of International Business*, 2nd ed., Oxford, Oxford University Press, pp. 417-446.

Colovic, A. and Mayrhofer, U. (2011), Optimising the location of R&D and production activities: Trends in the automotive industry, *European Planning Studies*, Vol. 19, N° 8, pp. 1481-1498.

Dameron, S. and Josserand, E. (2007), Le développement d'une communauté de pratique. Une analyse relationnelle, *Revue Française de Gestion*, N° 174, pp. 131-148.

Doz, Y.L. and Prahalad, C.K. (1984), Patterns of strategic control within multinational corporations, *Journal of International Business Studies*, Vol.15, N° 2, pp. 55-72.

Dunning, J. (2009), Location and the multinational enterprise: A neglected factor?, *Journal of International Business Studies*, Vol. 40, N° 1, pp. 5-19.

Eden, L. (2009), Innovations in international business theory, *Journal of International Business Studies*, Vol. 40, N° 9, pp. 1407-1410.

Galunic, D.C. and Eisenhardt, K.M. (2001), Architectural innovation and modular corporate forms, *Academy of Management Journal*, Vol. 47, N° 6, pp. 1229-1249.

Grant, R.M. (1996), Toward a knowledge-based theory of the firm, *Strategic Management Journal*, Vol. 17, N° 7, pp. 109-122.

Harzing, A-W. K. (1999), *Managing the multinationals: an international study of control mechanisms*, Cheltenham, Edward Elgar.

Hedlund, G. and Ridderstråle, J. (1995), International development projects. Key to competitiveness, impossible or mismanaged?, *International Studies of Management & Organization*, Vol. 25, N° 1-2, pp. 158-184.

Hennart, J.-F. (2009), Down with MNE-centric theories! Market entry and expansion as the bundling of MNE and local assets, *Journal of International Business Studies*, Vol. 40, N° 9, pp. 1432-1454.

Lee, G. and Cole, R. (2003), From a Firm-Based to a Community-Based Model of Knowledge Creation: The Case of the Linux Kernel Development, *Organization Science*, Vol. 14, N° 6, pp. 633-649.

Lindkvist, L. (2005), Knowledge Communities and Knowledge Collectivities: A Typology of Knowledge Work in Groups, *Journal of Management Studies*, Vol. 42, N° 6, pp. 1189-1210.

Manolopoulos, D., Söderquist, K.E. and Pearce R. (2011), Coordinating decentralized research and development laboratories: a survey analysis, *Journal of International Management*, Vol. 17, N° 2, pp. 114-129.

Martinez, J. I. and Jarillo, C. J. (1991), Coordination demands of international strategies, *Journal of International Business Studies*, Vol. 22, N° 3, pp. 429-444.

Mayrhofer, U. (2011) (ed.), *Le management des firmes multinationales*, Paris, Vuibert.

Mayrhofer, U. and Urban, S. (2011), *Management international. Des pratiques en mutation*, Paris, Pearson Education.

McDermott, R. (1999), Why information technology inspired but cannot deliver knowledge management, *California Management Review*, Vol. 41, N° 4, pp. 103-117.

Mintzberg, H. (1989), *Le Management. Voyage au centre des organisations*, Paris, Editions d'Organisation.

Nobel, R. and Birkinshaw, J. (1998), Innovation in multinational corporations: control and communication patterns in international R&D operations, *Strategic Management Journal*, Vol. 19, N° 5, pp. 479-496.

Pearce, R.D. (1989), *The Internationalization of Research and Development by Multinational Enterprises*, New York, St. Martin's Press.

Reger, G. (1999), Internationalization and coordination of research and development at large corporations, *Management International*, Vol. 3, N° 2, pp. 13-32.

Reger, G. (2004), Coordinating globally dispersed research centers of excellence - the case of Philips Electronics, *Journal of International Management*, Vol. 10, N° 1, pp. 51-76.

Roberts, J. (2006), Limits to Communities of Practice, *Journal of Management Studies*, Vol. 43, N° 3, pp. 623-639.

Rugman, M.A. and Verbeke, A. (2001), Subsidiary-Specific Advantages in Multinational Enterprises, *Strategic Management Journal*, Vol. 22, N° 3, pp. 237-250.

SEB Group (2009), *Business & Sustainable Development Report*.

SEB Group (2010), *Business & Sustainable Development Report*.

UNCTAD (2010), *World Investment Report. Investing in a Low-Carbon Economy*, New York/Geneva, United Nations Conference on Trade and Development.

Thomas, W.A., Kellogg, W.A. and Erickson, T. (2001), The knowledge management puzzle: human and social factors in knowledge management, *IBM Systems Journal*, Vol. 40, N° 4, pp. 863-884.

Wenger E., McDermott R. and Snyder W. (2002), *Cultivating Communities of practice: a guide to managing knowledge*, Boston, Harvard Business School Press.

Wenger E. and Snyder W. (2000), Communities of Practice: The Organizational Frontier, *Harvard Business Review*, Vol. 78, N° 1, pp. 139-145.